IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Attorney Docket No. 13784US02

In the Application of:

    Uri Elzur

Serial No. 10/651,459

Filed: August 29, 2003

For: SYSTEM AND METHOD FOR
HANDLING OUT-OF-ORDER FRAMES

Examiner: Brian D. Nguyen

Group Art Unit: 2661

Confirmation No. 8761

APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

    This is an appeal from an Office Action dated November 22, 2005 ("the Final Office Action"), in which claims 1-12 and 14-29 were finally rejected and claim 13 was objected to. The Applicant respectfully requests that the Board of Patent Appeals and Interferences reverse the final rejection of claims 1-29 of the present application. The Applicant notes that this Appeal Brief is timely filed within the period for reply that ends on June 30, 2006.

REAL PARTY IN INTEREST
(37 C.F.R. § 41.37(c)(1)(i))

Broadcom Corporation, a corporation organized under the laws of the state of California, and having a place of business at 16215 Alton Parkway, Irvine, California 92618-3616, has acquired the entire right, title and interest in and to the invention, the application, and any and all patents to be obtained therefor, as set forth in the Assignment recorded at Reel 014358, Frame 0034 in the PTO Assignment Search room.

RELATED APPEALS AND INTERFERENCES
(37 C.F.R. § 41.37(c)(1)(ii))

Not applicable.

STATUS OF THE CLAIMS
(37 C.F.R. § 41.37(c)(1)(iii))

Claims 1-12 and 14-29 were finally rejected and claim 13 was objected to. Pending claims 1-29 are the subject of this appeal.

The present application includes claims 1-29, which are pending in the present application.[1] Claim 13 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.[2] Claims 1, 4-12, and 14-22 stand rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent Application Publication 2002/0034182 ("Mallory")[3]. Claims 2-3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Mallory in view of United States Patent Application Publication 20030046330 ("Hayes")[4]. Claims 23-29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Mallory in view of Hayes and admitted prior

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[1] *See* Present Application ("Application") at pages 33-37.
[2] *See* the Final Office Action at page 7.
[3] *See id.* at page 3.
[4] *See id.* at page 5.

art (APA) (paragraph 09 of the background of the Application)[5] The Applicant identifies claims 1-29 as the claims that are being appealed. The text of the pending claims is provided in the Claims Appendix.

STATUS OF AMENDMENTS
(37 C.F.R. § 41.37(c)(1)(iv))

The Applicant's amendments submitted with the February 14, 2006 Office Action Response were entered by the Examiner in the March 20, 2006 Advisory Office Action. The Applicant has not amended any claims subsequent to the February 14, 2006 Office Action Response.

SUMMARY OF CLAIMED SUBJECT MATTER
(37 C.F.R. § 41.37(c)(1)(v))

The invention of claim 1 is illustratively described in the Specification of the present application at, for example, paragraph [14]. Some aspects of the present invention may be found in, for example, systems and methods that handle out-of-order frames[6]. In one embodiment, the present invention may provide a method that handles out-of-order frames[7]. The method may include, for example, one or more of the following: receiving an out-of-order frame via a network subsystem; placing data of the out-of-order frame in a host memory; and managing information relating to one or more holes in a receive window[8]. In a further embodiment, the network subsystem may include, for example, a network controller or an offload engine[9]. Moreover, the data of the out-of-order frame may be placed in a temporary buffer, an upper layer protocol (ULP) buffer or an application buffer residing in the host memory[10].

Claims 2-16 are dependent upon claim 1.

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[5] *See id.* at page 6.
[6] *See* present application at page 7, lines 1-2.
[7] *See id.* at page 7, lines 2-3.
[8] *See id.* at page 7, lines 3-6.
[9] *See id.* at page 7, lines 6-8.
[10] *See id.* at page 7, lines 8-10.

The invention of claim 17 is illustratively described in the Specification of the present application at, for example, paragraph [15]. In another embodiment, the present invention may provide a method that handles out-of-order frames[11]. The method may include, for example, one or more of the following: parsing an out-of-order frame into control information and data information; processing at least one of the control information, the data information and context information to determine a buffer location in a host memory in which to place the data information; and managing receive window hole information[12]. In a further embodiment, the receive window hole information may be, for example, TCP receive window hole information[13].

Claims 18-22 are dependent upon claim 17.

The invention of claim 23 is illustratively described in the Specification of the present application at, for example, paragraph [16]. In yet another embodiment, the present invention may provide a system that handles out-of-order frames[14]. The system may include, for example, a host and a network subsystem[15]. The host may include, for example, a host memory[16]. The network subsystem may be coupled to the host[17]. The network subsystem may process an out-of-order frame, place data of the out-of-order frame in the host memory, and manage information relating to one or more holes in a receive window[18]. In a further embodiment, the network subsystem may include, for example, a network controller or an offload engine on a network interface card (NIC)[19]. In another further embodiment, the network subsystem may include, for

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[11] *See id.* at page 7, lines 11-12.
[12] *See id.* at page 7, lines 12-16.
[13] *See id.* at page 7, lines 17-18.
[14] *See id.* at page 7, lines 19-20.
[15] *See id.* at page 7, lines 20-21.
[16] *See id.* at page 7, line 21.
[17] *See id.* at page 7, lines 21-22.
[18] *See id.* at page 7, lines 22-24.
[19] *See id.* at page 7, lines 25-26.

example, a network controller or an offload engine that is embedded on a motherboard or integrated into a main chipset[20].

Claims 24-29 are dependent upon claim 23.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL
(37 C.F.R. § 41.37(c)(1)(vi))

Claims 1, 4-12, and 14-22 stand rejected under 35 U.S.C. 102(b) as being anticipated by Mallory. Claims 2-3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Mallory in view of Hayes. Claims 23-29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Mallory in view of Hayes and the APA.

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[20] *See id.* at page 7, lines 26-27 to page 8, lines 1-2.

ARGUMENT
(37 C.F.R. § 41.37(c)(1)(vii))

The Final Office Action rejects claims 1, 4-12, and 14-22 under 35 U.S.C. 102(b) as being anticipated by Mallory. Claims 2-3 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Mallory in view of Hayes. Claims 23-29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Mallory in view of Hayes and the APA. Claim 13 was objected to as being dependent upon a rejected base claim.

I   **Rejection of Independent Claims 1 and 17 under 35 U.S.C. § 102(b)**

The Applicant first turns to the rejection of independent claims 1 and 17 under 35 U.S.C. § 102(b). With regard to the anticipation rejections under 102(b), MPEP 2131 states that "[a] claim is anticipated only if **each and every element** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." See Manual of Patent Examining Procedure (MPEP) at 2131 (internal citation omitted). Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." See id. (internal citation omitted).

Mallory "relates to communications systems in general and, more specifically, to methods and apparatus for reducing data loss on a network with an unreliable physical layer." See Mallory at ¶ [0001].

Claim 1 recites, in part, "placing data of the out-of-order frame in a **host memory**," while claim 17 recites, in part, "processing at least one of the control information, the data information and context information to determine a buffer location in **a host memory**...." The Final Office Action states the following: "Mallory clearly teaches in paragraph 0011 that the receiver buffers the out-of-order frame in a receiver buffer and in paragraph 0060 Mallory teaches that if they are out-of-order ... buffer frames following a gap for a time **in a reorder buffer**." See the Final Office Action at page 8 (emphasis in original). In addition, the Office Action of March 20, 2006

("Advisory Office Action") states: "The host memory as claimed is merely used to store the out-of-order frames and the receive buffer disclosed by Mallory is also used to store the out-of-order frames. Therefore, the receive buffer is equivalent to the host memory." *See* the Advisory Office Action at page 2. The Applicant respectfully disagrees with such assertion of equivalence.

Notably, the Final Office Action only asserts that Mallory teaches placing the frame in a "reorder buffer," but not a **host memory**, as recited in the claims 1 and 17. In particular, the Final Office Action and the Advisory Office Action rely on ¶ [0011] of Mallory, which states the following:

> In some specific embodiments, the sender transmits the transmitted frame to more than one receiver, such as in a multicast or broadcast mode. The frame identifiers can be a set of sequential integers with frames transmitted in sequential frame order. In some embodiments, when a receiver receives a frame out of order, the receiver buffers the out of order frame in a receiver buffer for a receive buffer period until preceding frame are received or the receive buffer period expires.

See Mallory at ¶ [0011]. Mallory only states that the frame out of order may be buffered in a **receiver buffer**. Mallory, however, does not teach, nor suggest, that the receiver buffer is, or within, a **host memory**. The Applicant further disagrees with the Examiner's assessment in the Advisory Office Action that "the receive buffer is equivalent to the host memory." The Applicant submits that **the terms "receive buffer" and "host memory" have a specific meaning and use in the relevant arts and are clearly not equivalent.**

Further, the Final Office Action and the Advisory Office Action rely on paragraph [0060] of Mallory. Paragraph [0060] of Mallory recites the following:

> If the next higher layer does not require frames to be delivered in order, the LARQ handler will pass up frames as they are received, rather than storing the out of order frames. However, where the next higher layer requires frames in order, or assumes the loss of frames if they are out of order, the LARQ handler should be configured to buffer frames following a gap for a time in a reorder buffer so that if the receiver can fill the gap with

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retransmitted frames in time, the frames can be passed to the next layer in sequence order.

Similar to ¶ [0011] of Mallory, this paragraph merely **discloses that out-of-order frames may be stored in a buffer, but does not teach or suggest "placing data of the out-of-order frame in a host memory**," that the buffer is in a host memory, or "managing information relating to one or more holes in a receive window," as claimed by the Applicant.

The Final Office Action also states the following:

> Also in paragraph 0060, Mallory teaches "**managing** information relating to one or more holes (gap) in a receive window by buffering frames following a gap (hole) for a time in a reorder buffer so that if the receiver can fill the gap with retransmitted frames in time, the frames can be passed to the next layer in sequence order. In paragraph 0141, Mallory further teaches of managing including updating the sequence number.

See the Final Office Action at pages 8-9 (emphais in original). The Advisory Office Action also seeks support in similar language from paragraph [0060] of Mallory. *See* the Advisory Office Action at page 2. With respect to ¶ [0060] of Mallory, shown above, there is simply nothing in that passage that relates to a "receive window," and certainly not "managing information relating to one or more holes in a receive window." That passage merely discloses a LARQ handler, but **does not teach or suggest a "receive window," or "managing information relating to one or more holes in a receive window."** The Examiner has not provided the Applicant with a **quotation and pinpoint citation** to where such limitations are disclosed in ¶ [0060].

Additionally, the Advisory Office Action and the Final Office Action continue to rely on ¶ [0140] of Mallory. Mallory, at ¶ [0140] states the following:

> If a received frame's sequence number (not a Nack control frame) is new and within a window of MaxRxSaveCountChannel from Receive Sequence Number, the receiver will update its state by advancing the window of recent sequence numbers until the received frame's sequence number is current. If the received frame's new sequence number was outside of the valid sequence numbers, the sequence number should

> have been treated as out-of-sequence, and the channel reset function
> performed so that the new frame will be in-sequence.

This portion of Mallory merely states that a frame's sequence number may be within a

window of MaxRxSaveCountChannel. While the "receiver will update its state by

advancing the window of recent sequence numbers until the received frame's sequence

number is current," this portion of **Mallory does not teach, nor suggest, "placing**

data of the out-of-rder frame in a host memory," or "managing information

relating to one or more holes in a receive window," as recited in claim 1, nor

"determin[ing] a buffer location in a **host memory** in which to place the data

information," or "managing receive window hole information," as recited in claim 17.

Instead, this portion of Mallory merely discloses that windows are advanced based on

their sequence numbers.

The Advisory Office Action and the Final Office Action also continue to rely on ¶

[0141] of Mallory to reject claims 1 and 17. *See* the Final Office Action at pages 3-5

and the Advisory Office Action at page 2. This paragraph of Mallory, however, states

the following:

> The Receive Sequence Number is repeatedly incremented by 1 (modulo
> 256, or other size of the sequence space) until it is equal to the received
> frame's sequence number. Each time it is updated, the state of the new
> current sequence number is initialized as missing and the time when it
> was first missed is recorded, unless the current number is that of the
> receive frame and the receive frame was a valid data frame (not a
> reminder and not errored). **If the frame is marked received, it is also**
> **saved,** possibly temporarily. For each new sequence number, **the trailing**
> **edge of the sliding window of recent sequence numbers also**
> **changes**. The new oldest recent sequence number is checked to see
> there is a held frame. If there is a saved frame (Rx Frame Flag=1), that
> frame is sent up to next higher layer and Rx Frame Flag is set to 0. When
> the current sequence number has been fully updated to the received
> sequence number, the receiver then scans the history of recent frames,
> starting with the oldest sequence number not yet lost or sent up. If that
> sequence number has a held frame, then that frame and any in-sequence
> held frames that follow it are sent up to the next higher layer. This will

result in the just-received frame to be sent up to the next higher layer, if appropriate.

See Mallory at ¶ [0141]. This portion of Mallory merely discloses that sequence numbers are repeatedly incremented, and that received frames are saved. While "trailing edges of sliding windows of recent sequence numbers also change," **there is nothing in this portion of Mallory that teaches or suggests "placing data of the out-of-order frame in a host memory," "managing information relating to one or more holes in a receive window**," as recited in claim 1, and "determin[ing] a buffer location in a **host memory** in which to place the data information," or "**managing receive window hole information**," as recited in claim 17. The Applicant respectfully submits that a change in the sequence number of a sliding window is by no means "managing information relating to one or more holes in a receive window," or "managing receive window hole information."

In addition, the Advisory Office Action states: "'Managing' as claimed in claim 1 could be storing, updating, incrementing, etc." The Applicant respectfully disagrees with such interpretation as the language from paragraphs [0060], [0140], and [0141] of Mallory does not disclose or suggest "managing information **relating to one or more holes resulting from the out-of-order frame in a receive window**," as claimed by the Applicant.

The Applicant would like to point out that the cited paragraphs 0060, 0140, and 0141 of Mallory do not relate to "managing information relating to one or more holes," as recited by the Applicant in claim 1. The cited paragraphs 0060 of Mallory relates to, for example, buffering of frames in a reorder buffer. The cited paragraphs 0140 of Mallory relates to, for example, updating a receiver state. The cited paragraphs 0141 of Mallory relates to, for example, incrementing a receive sequence number and temporarily saving a frame. In this regard, the Applicant disagrees with the Examiner's assertion in the Advisory Office Action that "paragraphs 0060, 0140, and 0141 clearly describe this limitation." The Applicant submits that **paragraphs 0060, 0140, and 0141**

clearly do not describe this limitation of "managing information relating to one or more holes," as recited by the Applicant in claim 1, or "managing receive window hole information," as recited in claim 17.

Consequently, while the portions of Mallory cited by the Examiner (such as paragraphs 0060, 0140, and 0141) disclose that certain frames may be saved, they **do not teach, nor suggest, "placing data of the out-of-order frame in a host memory," or "managing information relating to one or more holes in a receive window," as recited in claim 1, and "managing receive window hole information" or "determin[ing] a buffer location in a host memory in which to place the data information," as recited in claim 17.** Thus, at least for the reasons stated above, the Applicant respectfully submits that Mallory does not anticipate independent claims 1 and 17, and that the Final Office Action has not established a *prima facie* case of obviousness with respect to these claims.

II.   Rejection of Dependent Claim 4 under 35 U.S.C. § 102(b)

Claim 4 depends on independent claim 1. Therefore, the Applicant submits that claim 4 is allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

Additionally, the Applicant submits that Mallory does not disclose or suggest at least the limitation of "the network subsystem does not store one or more missing frames relating to the out-of-order frame," as claimed by the Applicants in claim 4. In order to overcome this deficiency, the Final Office Action refers to Figure 10 of Mallory. However, the Applicant would like to point out that Mallory does not disclose or suggest any processing action (or lack thereof) with regard to **one or more missing frames**, as recited by the Applicant in claim 4. Accordingly, the Applicant submits that claim 4 is allowable over the references cited in the Final Office Action.

III.   Rejection of Dependent Claim 5 under 35 U.S.C. § 102(b)

Claim 5 depends on independent claim 1. Therefore, the Applicant submits that claim 5 is allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

IV.   Rejection of Dependent Claim 6 under 35 U.S.C. § 102(b)

Claim 6 depends on independent claim 1. Therefore, the Applicant submits that claim 6 is allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

Additionally, the Applicant submits that Mallory does not disclose or suggest at least the limitation of "placing the data of the out-of-order frame in the host memory if the out-of-order frame is determined to be inside the receive window," as claimed by the Applicant in claim 6. In order to overcome this deficiency, the Final Office Action refers to Figure 10 and paragraphs 0057-0058 of Mallory. The Applicant would like to point out that even though Mallory discloses, at the above citations, that "if the current frame is not the oldest missing frame, it is stored in the receiver's reorder buffer (S14)," Mallory clearly does not disclose or suggest "placing the data of the out-of-order frame in the host memory if the out-of-order frame is determined to be inside the receive window," as recited by the Applicant in claim 6. Accordingly, the Applicant submits that claim 6 is allowable over the references cited in the Final Office Action.

V.   Rejection of Dependent Claim 7 under 35 U.S.C. § 102(b)

Claim 7 depends on independent claim 1. Therefore, the Applicant submits that claim 7 is allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

VI.   Rejection of Dependent Claim 8 under 35 U.S.C. § 102(b)

Claim 8 depends on independent claim 1. Therefore, the Applicant submits that claim 8 is allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

The Applicant also submits that Mallory does not disclose or suggest at least the limitation of "placing a portion of the data of the out-of-order frame in the host memory, the portion of the data being inside the receive window," as claimed by the Applicant in claim 8. In order to overcome this deficiency, the Final Office Action refers to Figure 10 and paragraphs 0057-0058 of Mallory. The Applicant would like to point out that even though Mallory discloses, at the above citations, that "if the current frame is not the oldest missing frame, it is stored in the receiver's reorder buffer (S14)," Mallory clearly does not disclose or suggest "placing a portion of the data of the out-of-order frame in the host memory, the portion of the data being inside the receive window," as recited by the Applicant in claim 8. Accordingly, the Applicant submits that claim 8 is allowable over the references cited in the Final Office Action.

VII.   Rejection of Dependent Claims 9-10 under 35 U.S.C. § 102(b)

Claims 9 and 10 depend on independent claim 1. Therefore, the Applicant submits that claims 9 and 10 are allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

The Applicant additionally submits that Mallory does not disclose or suggest at least the limitation of "storing information relating to a new hole ... updating information relating to an existing hole ..., and deleting information relating to a plugged hole ...," as claimed by the Applicant in claims 9-10. In order to overcome this deficiency, the Final Office Action refers to status table 122 in Figure 4 and paragraph 0074 of Mallory. The Applicant would like to point out that neither Figure 4 nor paragraph 0074 disclose or suggest "storing information relating to a new hole ... updating information relating to an

existing hole ...", and deleting information relating to a plugged hole ...," as recited by the Applicant in claims 9-10. Accordingly, the Applicant submits that claims 9-10 are allowable over the references cited in the Final Office Action.

VIII.   Rejection of Dependent Claim 11 under 35 U.S.C. § 102(b)

Claim 11 depends on independent claim 1. Therefore, the Applicant submits that claim 11 is allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

The Applicant further submits that Mallory does not disclose or suggest at least the limitation of "the managed information resides on the network subsystem," as claimed by the Applicant in claim 11. In order to overcome this deficiency, the Final Office Action refers to table 122 in Figure 4 of Mallory. The Applicant would like to point out that table 122 is a receive status table. In this regard, Mallory clearly does not disclose or suggest the limitation of "the managed information resides on the network subsystem," as recited by the Applicant in claim 11. Accordingly, the Applicant submits that claim 11 is allowable over the references cited in the Final Office Action.

IX.   Rejection of Dependent Claim 12 under 35 U.S.C. § 102(b)

Claim 12 depends on independent claim 1. Therefore, the Applicant submits that claim 12 is allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

In addition, the Applicant submits that Mallory does not disclose or suggest at least the limitation of "updating the receive window based upon the placement of the data of the out-of-order frame," as claimed by the Applicant in claim 12. In order to overcome this deficiency, the Final Office Action refers to paragraph 0140 of Mallory. The Applicant would like to point out that even though Mallory discloses, at the above

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citations, that "the receiver will update its state by advancing the window of recent sequence numbers...," Mallory clearly does not disclose or suggest the limitation of "updating the receive window based upon the placement of the data of the out-of-order frame," as recited by the Applicant in claim 12. Accordingly, the Applicant submits that claim 12 is allowable over the references cited in the Final Office Action.

X. Rejection of Dependent Claim 14 under 35 U.S.C. § 102(b)

Claim 14 depends on independent claim 1. Therefore, the Applicant submits that claim 14 is allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

Additionally, the Applicant submits that Mallory does not disclose or suggest at least the limitation of "mapping TCP space into host buffer space," as claimed by the Applicant in claim 14. In order to overcome this deficiency, the Final Office Action refers to buffer 120 in Figure 4 of Mallory. The Applicant would like to point out that Mallory does not disclose or suggest that "received TCP frames are stored (mapped) in the reorder buffer 120," as suggested by the Examiner. Furthermore, the Applicant submits that storing and mapping are not the same functions and may not be equated. Mallory clearly does not disclose or suggest the limitation of "mapping TCP space into host buffer space," as recited by the Applicant in claim 14. Accordingly, the Applicant submits that claim 14 is allowable over the references cited in the Final Office Action.

XI. Rejection of Dependent Claims 15-16 under 35 U.S.C. § 102(b)

Claims 15-16 depend on independent claim 1. Therefore, the Applicant submits that claims 15-16 are allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

XII.   Rejection of Dependent Claims 17-22 under 35 U.S.C. § 102(b)

Claims 17-22 depend on independent claim 1. Therefore, the Applicant submits that claims 17-22 are allowable over the references cited in the Final Office Action at least for the reasons stated above with regard to claim 1.

The Applicant also submits that Mallory does not disclose or suggest at least the limitation of "parsing an out-of-order frame into control information and data information ... processing at least one of the control information ... and managing receive window hole information related to the out-of-order frame," as claimed by the Applicant in claims 17-22. In order to overcome this deficiency, the Final Office Action refers to Figures 6-8 and paragraphs 0011 and 0140-0141 of Mallory. The Applicant would like to point out that Mallory does not disclose or suggest, at the above citations, any of the limitations of "parsing an out-of-order frame into control information and data information ... processing at least one of the control information ... and managing receive window hole information related to the out-of-order frame," as recited by the Applicant in claims 17-22. Accordingly, the Applicant submits that claims 17-22 are allowable over the references cited in the Final Office Action.

XIII. The Proposed Combination of Mallory and Hayes Does Not Render Claims 2-3 Unpatentable

The Applicant now turns to the rejection of claims 2-3 under 35 U.S.C. § 103(a) as being unpatentable over Mallory in view of Hayes. With regard to an obviousness rejection, the Manual of Patent Examining Procedure (MPEP) states that in order for a prima facie case of obviousness to be established, three basic criteria must be met.[21] First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable

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[21] *See* MPEP § 2142.

expectation of success. Finally, *the prior art reference (or references when combined) must teach or suggest all the claim limitations.* Further, MPEP § 2143.01 states that "the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination," and that "although a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so'"[22]. Moreover, MPEP § 2143.01 also states that the level of ordinary skill in the art cannot be relied upon to provide the suggestion."[23]

Claim 2 recites, in part, "the out-of-order frame is received via a TCP offload engine (TOE) of the network subsystem or a TCP-enabled Ethernet controller (TEEC) of the network subsystem." The proposed combination of Mallory and Hayes does not teach or suggest this limitation, as well as the limitations discussed above with respect to claim 1. Thus, at least for these reasons, the Applicant respectfully submits that claims 2-3 are in condition for allowance.

The Applicant would like to point out that "in determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is **not** whether the differences themselves would have been obvious, but whether the claimed invention <u>as a whole</u> would have been obvious." MPEP at § 2141.02. The law is well settled that "obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so." *ACS Hospital Systems, Inc. v. Montfiore Hospital*, 732 F.2d 1572, 1577, 221 USPQ 929 (Fed. Cir. 1984). It is not permissible to pick and choose among the individual elements of assorted prior art references to re-create the claimed invention, but rather "some teaching or suggestion in the references to support their use in the particular claimed combination" is needed. *Symbol Technologies, Inc. v. Opticon, Inc.* 935 F.2d 1569, 1576, 19 USPQ2d 1241 (Fed. Cir. 1991).

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[22] *See* In re Mills, 916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990).
[23] Al-Site Corp. v. VSI Int'l Inc., 174 F.3d 1308, 50 USPQ 2d 1161 (Fed. Cir. 1999).

In *Ex parte Hiyamazi*, the Board of Patent Appeals and Interferences reversed a rejection based on a combination of references, stating, in part:

> Under 35 USC § 103, where the Examiner has relied upon the teachings of several references, the test is whether or not the reference viewed individually and collectively would have suggested the claimed invention to the person possessing ordinary skill in the art. Note *In re Kaslow*, 707 F.2d 1366, 107 USPQ 1089 (Fed.Cir. 1983). **It is to be noted, however, that citing references which merely indicate the isolated elements and/or features recited in the claims are known is not a sufficient basis for concluding that the combination of claimed references would have been obvious.** That is to say, there should be something in the prior art or a convincing line of reasoning in the answer suggesting the desirability of combining the claimed invention. Note *In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed.Cir. 1986).

Ex parte Hiyamazi, 10 USPQ2d 1393, 1394 (Bd. Pat. App. & Interf. 1988) (emphasis added).

The Applicant respectfully submits that the Final Office Action does not identify a proper motivation to combine Mallory and Hayes to reject the claims of the present application. **Merely identifying isolated elements (such as a TOE or a TEEC) in the prior art is not enough to establish a *prima facie* case of obviousness**, as shown below:

> [M]ere identification in the prior art of each element is insufficient to defeat the patentability of the combined subject matter as a whole. [*In re Rouffet*, 149 F. 3d 1350] at 1355, 1357 [(Fed. Cir. 1998)]. Rather, to establish a prima facie case of obviousness based on a combination of elements disclosed in the prior art, the Board must articulate the basis on which it concludes that it would have been obvious to make the claimed invention. *Id.* In practice, this **requires** that the Board "explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious." *Id.* at 1357-59. This entails

consideration of both the "scope and content of the prior art" and "level of ordinary skill in the pertinent art" aspects of the Graham test.

When the Board does not explain the motivation, or the suggestion or teaching, that would have led the skilled artisan at the time of the invention to the claimed combination as a whole, we infer that the Board used hindsight to conclude that the invention was obvious. *Id.* at 1358.

See *in re Kahn,* 441 F.3d 977 (Fed. Cir. March 22, 2006) (emphasis added).

As the MPEP dictates, the "teaching or suggestion to make the claimed combination and the reasonable expectation of success must **both be found in the prior art, and not based on applicant's disclosure.**" *See* Manual of Patent Examining Procedure (MPEP) at § 2142, citing *In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (emphasis added). The Applicant respectfully submits, however, that the Final Office Action merely cites portions of the various references that may, but do not necessarily, disclose isolated claim limitations. The Final Office Action's statements regarding motivation to combine the references amount to no more than conclusory statements of convenient assumptions about one of ordinary skill in the art, which is a factual question that cannot be resolved on "subjective belief and unknown authority." *See In re Lee,* 277 F.3d 1338, 1344 (Fed. Cir. 2002). The Final Office Action does not explain the motivation, suggestion, or teaching to combine the various references. Again, mere identification of isolated elements is not enough to establish a *prima facie* case of obviousness. **"[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements."** *See in re Kahn,* 441 F.3d 977 (emphasis added).

As the Federal Circuit has held, the "factual inquiry whether to combine references must be thorough and searching." *See, e.g., McGinley v. Franklin Sports, Inc.* 262 F.3d 1339, 1351-52 (Fed. Cir. 2001). "It must be based on objective

evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with." *See In re Lee*, 277 F.3d at 1343 (internal citations omitted).

Federal Circuit "case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references." *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999). The "examiner can satisfy the burden of showing obviousness of the combination 'only by showing some **objective** teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teaching reference.'" *See in re Lee , 277 F. 3d at 1343, citing In re Fitch,* 972 F. 2d 1260, 1265 (Fed. Cir. 1992) (emphasis added).

Merely citing portions of separate and distinct references that may or may not disclose an isolated claim element, however, is not a proper identification of a motivation to combine. The law requires that the Final Office Action show an **objective** teaching to support the assertions regarding motivation to combine the references. In *In re Lee*, the Federal Circuit noted that the "Board rejected the need for 'any specific hint or suggestion in a particular reference' to support the combination of … references," which was an "[o]mission of a relevant factor **required by precedent**" that was both "**legal error** and **arbitrary** agency action." *See id.* at 1344, citing *Morot Vehicle Manufacturers Ass'n v. State Farm Mutual Automobile Ins. Co.*, 463 U.S. 29 at 43 (1983) (emphasis added).

Subjective opinion of "common knowledge" or "common sense" regarding a motivation to combine is not enough to establish a *prima facie* case of obviousness. The Applicant respectfully submits that the motivation to combine Mallory and Hayes in the Final Office Action is based on subjective knowledge and convenient assumptions gleaned from Applicant's disclosure, instead of the prior art (as is required by the Federal Circuit). Thus, at least for these reasons, the Applicant respectfully submits that claims 2-3 are in condition for allowance.

XIV. The Proposed Combination of Mallory, Hayes and the APA Does Not Render Claims 23-29 Unpatentable

The Applicant now turns to the rejection of claims 23-29 as being unpatentable over Mallory in view of Hayes and APA. Claim 23 recites, in part, "wherein the network subsystem places data of the out-of-order frame in a host memory," and "wherein the network subsystem manages information relating to one or more holes in a receive window." In order to meet these limitations, the Final Office Action refers to Figures 4-5 and paragraphs 0011, 0036, 1160, and 0141 of Mallory. Even though Mallory discloses, for example at paragraph 0011, storing out-of-order frames, the Applicant submits that none of the above citations of Mallory discloses or suggests at least the limitation of "the network subsystem manages information relating to one or more holes in a receive window," as recited by the Applicant in claims 23-29. Furthermore, neither Hayes nor the APA discloses or suggests the limitation of "the network subsystem manages information relating to one or more holes in a receive window," as recited by the Applicant in claims 23-29, in addition to the limitations discussed above with respect to claim 17. Accordingly, the Applicant submits that claims 23-29 are allowable over the combination of Mallory, Hayes, and the APA, as cited in the Final Office Action.

CONCLUSION

For at least the foregoing reasons, the Applicant submits that claims 1-29 are allowable. Reversal of the Examiner's rejection and issuance of a patent on the application are therefore requested.

The Commissioner is hereby authorized to charge $500 (to cover the Brief on Appeal Fee) and any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Ltd., Account No. 13-0017.

Respectfully submitted,

Date: 29-JUN-2006

By: _____

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CLAIMS APPENDIX
(37 C.F.R. § 41.37(c)(1)(viii))

1.   A method for handling out-of-order frames, comprising the steps of:

(a) receiving an out-of-order frame via a network subsystem;

(b) placing data of the out-of-order frame in a host memory; and

(c) managing information relating to one or more holes resulting from the out-of-order frame in a receive window.

2.   The method according to claim 1, wherein the out-of-order frame is received via a TCP offload engine (TOE) of the network subsystem or a TCP-enabled Ethernet controller (TEEC) of the network subsystem.

3.   The method according to claim 1, wherein the network subsystem does not store the out-of-order frame on an onboard memory.

4.   The method according to claim 3, wherein the network subsystem does not store one or more missing frames relating to the out-of-order frame.

5.   The method according to claim 1, wherein the network subsystem comprises a network interface card (NIC).

6.   The method according to claim 1, wherein step (b) comprises placing the data of the out-of-order frame in the host memory if the out-of-order frame is determined to be inside the receive window.

7.   The method according to claim 1, further comprising:

dropping the out-of-order frame if the out-of-order frame is determined not to be inside the receive window.

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8.   The method according to claim 1, further comprising:

placing a portion of the data of the out-of-order frame in the host memory, the portion of the data being inside the receive window.

9.   The method according to claim 1, wherein step (c) comprises one or more of the following:

storing information relating to a new hole created by the placement of the data of the out-of-order frame,

updating information relating to an existing hole modified by the placement of the data of the out-of-order frame, and

deleting information relating to a plugged hole created by the placement of the data of the out-of-order frame.

10.   The method according to claim 9,

wherein the stored information resides on the network subsystem,

wherein the updated information resides on the network subsystem, and

wherein the deleted information resided on the network subsystem.

11.   The method according to claim 1, wherein the managed information resides on the network subsystem.

12.   The method according to claim 1, further comprising:

updating the receive window based upon the placement of the data of the out-of-order frame.

13.   The method according to claim 1, further comprising:

setting a programmable limit with respect to a number of holes allowed in the receive window.

14.   The method according to claim 1, wherein step (b) comprises mapping TCP space into host buffer space.

15.   The method according to claim 1, wherein the network subsystem comprises a memory whose memory usage scales with a number of holes in the receive window.

16.   The method according to claim 1, wherein the network subsystem comprises a memory whose memory usage does not scale with a number of out-of-order frames received.

17.   A method for handling out-of-order frames, comprising:

parsing an out-of-order frame into control information and data information;

processing at least one of the control information, the data information and context information to determine a buffer location in a host memory in which to place the data information; and

managing receive window hole information related to the out-of-order frame.

18.   The method according to claim 17, wherein a network subsystem is adapted to parse the out-of-order frame into control information and data information.

19.   The method according to claim 17, wherein a network subsystem is adapted to process at least one of the control information, the data information and the context information to determine the buffer location in the host memory in which to place the data information.

20.   The method according to claim 17, wherein a network subsystem is adapted to manage receive window hole information generated by the placement of the data information.

21.   The method according to claim 20, wherein a network subsystem is adapted to store the receive window hole information managed by the network subsystem.

22.   The method according to claim 17, wherein the receive window hole information comprises TCP receive window hole information.

23.   A system for handling out-of-order frames, comprising:

a host comprising a host memory; and

a network subsystem coupled to the host via a host interface,

wherein the network subsystem processes an out-of-order frame,

wherein the network subsystem places data of the out-of-order frame in the host memory, and

wherein the network subsystem manages information relating to one or more holes in a receive window.

24.   The system according to claim 23, wherein the network subsystem comprises a TOE or a TEEC that provides flow-through processing and placement of the data of the out-of-order frame in the host memory.

25.   The system according to claim 23, wherein the data is placed in a temporary buffer, an upper layer protocol (ULP) buffer or an application buffer residing in the host memory.

26.   The system according to claim 23, wherein the network subsystem is adapted to process at least one of control information and data of the out-of-order frame to determine a buffer location in the host memory in which to place the data.

27.   The system according to claim 23, wherein the network subsystem is adapted to store the information relating to the one or more holes in the receive window.

28.   The system according to claim 23, wherein the network subsystem is not adapted to store the out-of-order frame on the network subsystem until one or more missing frames are received by the network subsystem.

29.   The system according to claim 23, wherein the network subsystem comprises a network interface card (NIC).

EVIDENCE APPENDIX
(37 C.F.R. § 41.37(c)(1)(ix))

(1)   United States Patent Application Publication 2002/0034182 ("Mallory"), entered into record by the Examiner in the August 2, 2005 Office Action.

(2)   United States Patent Application Publication 20030046330 ("Hayes"), entered into record by the Examiner in the August 2, 2005 Office Action.

RELATED PROCEEDINGS APPENDIX

(37 C.F.R. § 41.37(c)(1)(x))

Not applicable.